
# National Community Solar Partnership

Building with Benefits: Increased Resilience

June 7, 2023

# Housekeeping

- This session **is** being recorded
- Slides and a link to the recording will be made available online after the event
- Please put questions for panelists and moderators in the Q&A

# Welcome & Introductions

In the chat, please feel encouraged to share your name, organization, and why you're joining this conversation about increasing resilience

# Webinar Agenda

| Time (ET) | Topic | Presenter |
|---|---|---|
| 2:00 – 2:05 | Welcome & National Community Solar Partnership Overview | Allie Robins, U.S. Department of Energy |
| 2:05 – 2:20 | Overview: Resilience | Moderator: Seth Mullendore, Clean Energy Group |
| 2:20 – 2:40 | Project & Program Highlights: Increased Resilience | Dan Orzech, Oregon Clean Power Cooperative<br>Ingemar Mathiasson, Northwest Arctic Borough<br>Ben Paulos, Lawrence Berkeley National Lab |
| 2:40 – 3:10 | Panel Discussion and Q&A | Panelists & Moderator |
| 3:10 – 3:15 | Closing & Staying Engaged | Allie Robins, U.S. Department of Energy |

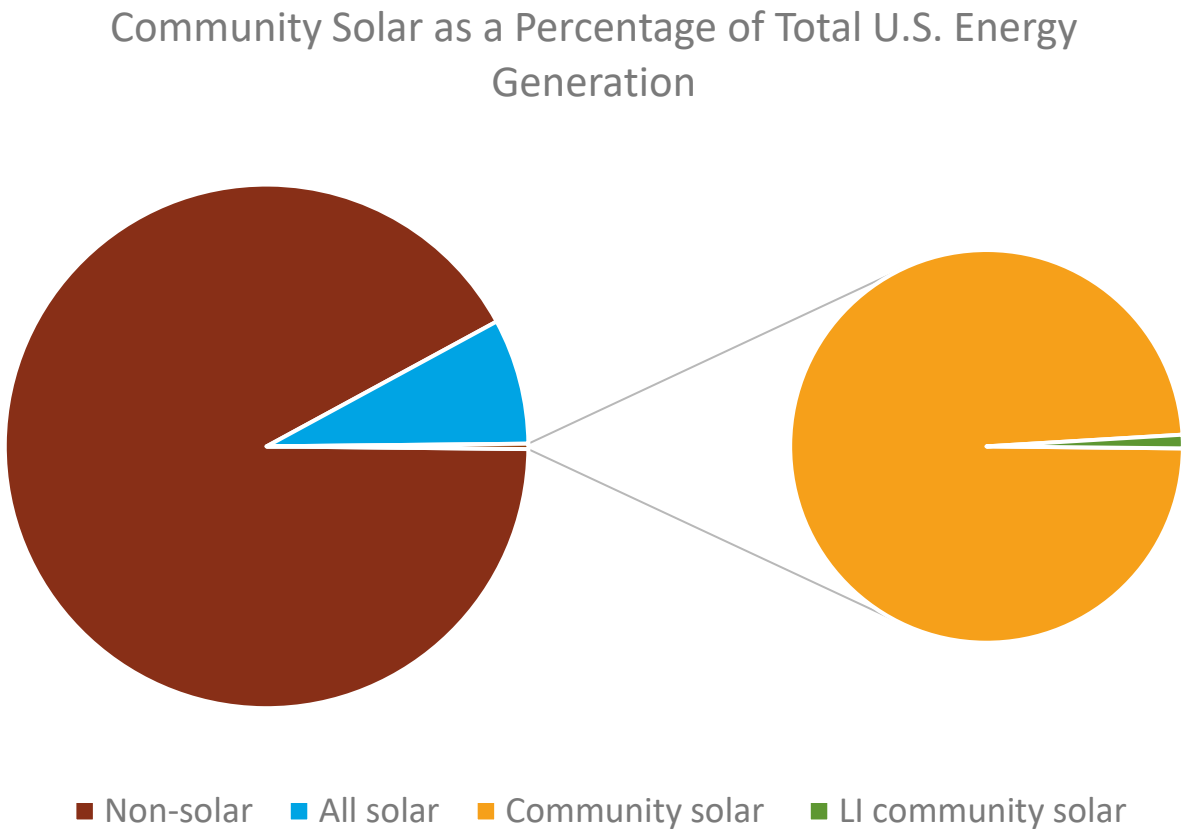
# National Community Solar Partnership Overview

# Community Solar Opportunity

- Half of all households and businesses **cannot** host a solar PV system on their roof, due to:
  - Solar Potential
  - Insufficient Roof Space (*e.g., high rise*)
  - Roof Ownership/Tenancy

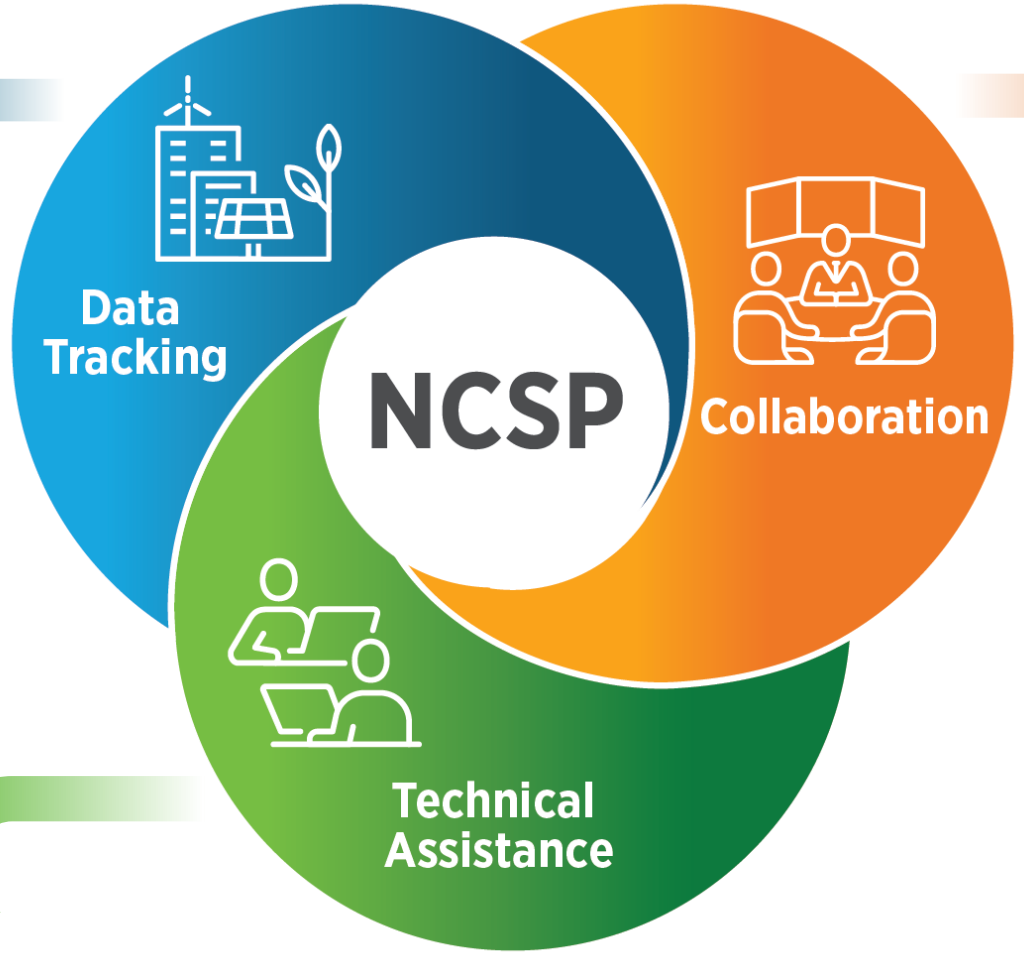
Across the United States:

- <10% of electricity is generated by solar
- <5% of all solar electricity is generated by community solar
- <1% of all community solar is mandated or incentivized to serve low- to moderate-income households




Sources: EIA, SEIA, NREL, NREL (unpublished)

# The National Community Solar Partnership



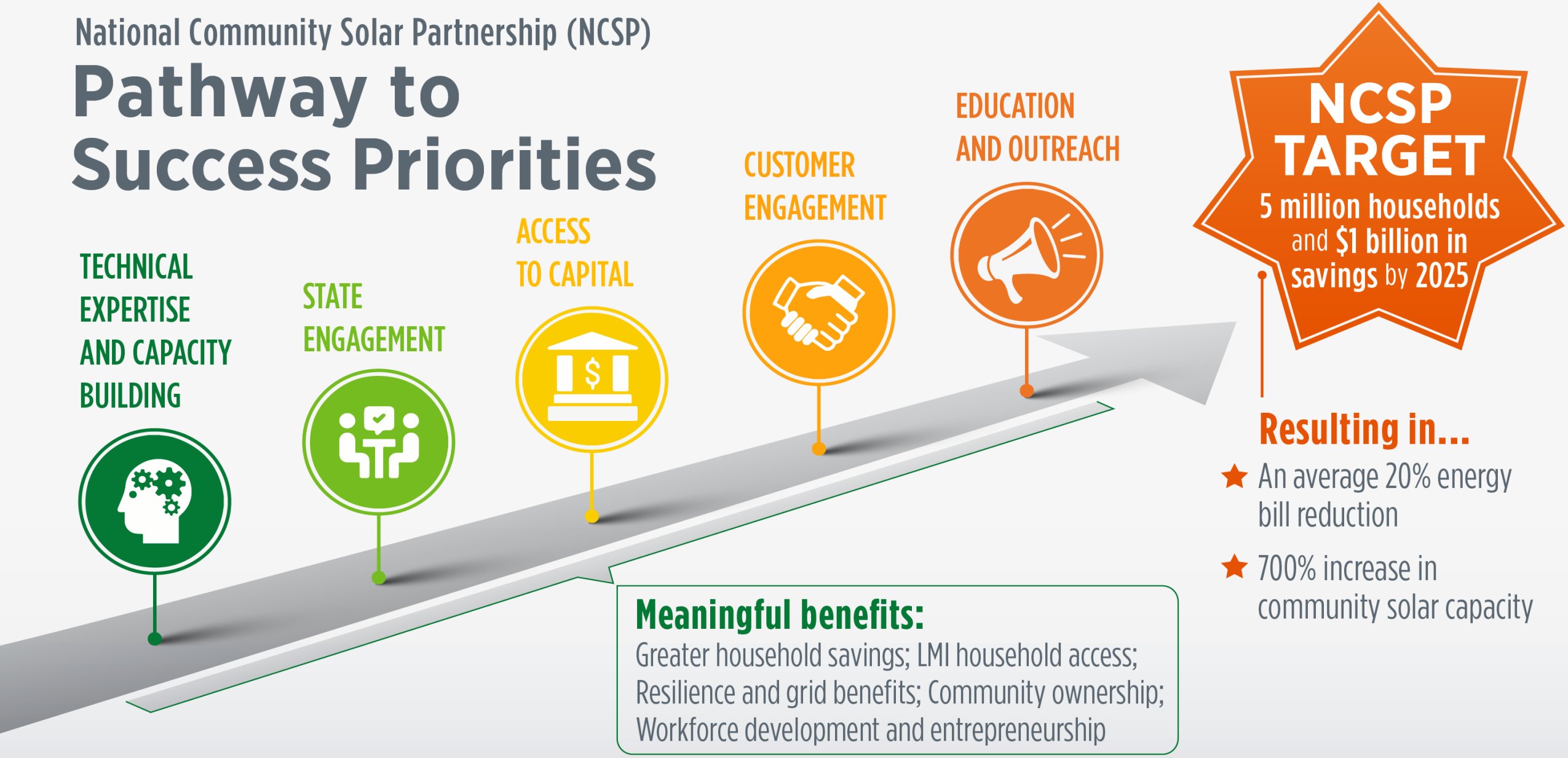

Sharing the Sun is a market trends annual report that is managed by the National Renewable Energy Laboratory (NREL) through NCSP; partner commitments are tracked to the program and its goal, and program evaluation is done to determine success.

Partners can access an online community platform, virtual/ in-person meetings, webinars and other tools to engage with DOE, National Labs, and each other to support community solar development.

Our technical assistance program, led by the Lawrence Berkeley National Laboratory, ensures that our partners have access to resources and direct technical assistance from DOE, National Labs, and third-party subject-matter experts to support local challenges.

National Community Solar Partnership (NCSP)

# Pathway to Success Priorities




COMMUNITY-BASED ORGANIZATIONS | STATE AND LOCAL GOVERNMENT | DEVELOPERS | INVESTORS | PHILANTHROPISTS | UTILITIES | CUSTOMERS

# Meaningful Benefits of Community Solar

## GREATER HOUSEHOLD SAVINGS

- Provide a reduction in electricity bills for residential subscribers to a project

**Justice40 Priority 1:**
Reduce Energy Burden

## LMI HOUSEHOLD ACCESS

- Include subscribers from low- to moderate-income (LMI) households

**Justice40 Priority 3:**
Increase Clean Energy Parity

## RESILIENCE AND GRID BENEFITS

- Include the capability to deliver power to households and/or critical facilities during a grid outage or strengthen grid operations

**Justice40 Priority 7:**
Increase Energy Resiliency

## COMMUNITY OWNERSHIP

- Local community members, subscribers, or local community organizations own or have equity in the project
- Other wealth-building strategies

**Justice40 Priority 8:**
Increase Energy Democracy

## WORKFORCE DEVELOPMENT AND ENTREPRENEURSHIP

- Support prevailing wages and pre-apprenticeship and apprenticeship programming
- Ensure women- and minority-owned businesses have equitable opportunity

**Justice40 Priority 6:**
Increase Clean Energy Jobs

# 2022 Sunny Awards for Equitable Community Solar

## $100,000 Prize

Recognize community solar projects and programs that employ or develop best practices to increase equitable access to the meaningful benefits of community solar

## Meaningful Benefits Categories

- Greater Household Savings
- Low- to Moderate-income Household Access
- Resilience and Grid Benefits
- Community Ownership
- Equitable Workforce Development
- *Innovation Category:* Community Engagement
- *Innovation Category:* Impact

## 2022 Grand Prize Projects & Programs serve 7,300 Low- to Moderate-Income Households


## 2023 Sunny Awards are open now!

Up to **$200,000** in Prizes
Applications due July 14th

# Clean Energy Group

**Seth Mullendore**

*President and Executive Director*

# Building with Benefits: Increased Resilience

**Seth Mullendore**
President and Executive Director
Clean Energy Group

*U.S. Department of Energy National Community Solar Partnership*
*Meaningful Benefits as a Foundation for Equitable Community Solar Webinar Series*
*June 7, 2023*


Clean Energy Group (CEG) works at the forefront of clean energy innovation to accelerate an equitable and inclusive transition to a resilient, sustainable, clean energy future.

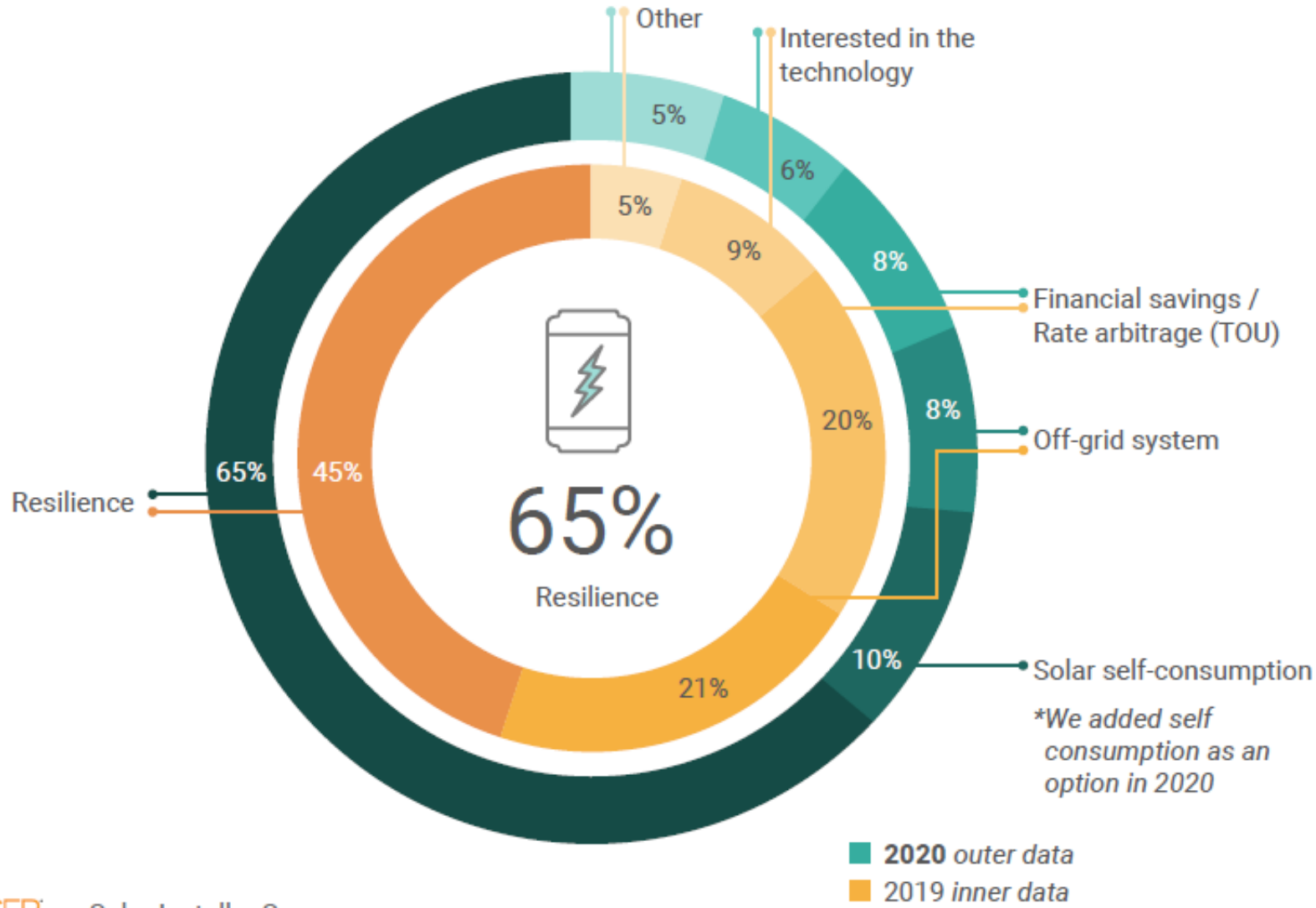
Visit www.cleanegroup.org to learn more about our current initiatives, recent publications, and upcoming events.


Accelerating the equitable development of solar and energy storage technologies in marginalized and underserved communities through:

- technical assistance to community-serving organizations
- community energy resilience capacity building
- preparing and disseminating information and resources
- advancing inclusive policies and programs

## ENERGY STORAGE:

# Primary Drivers and Barriers to Storage

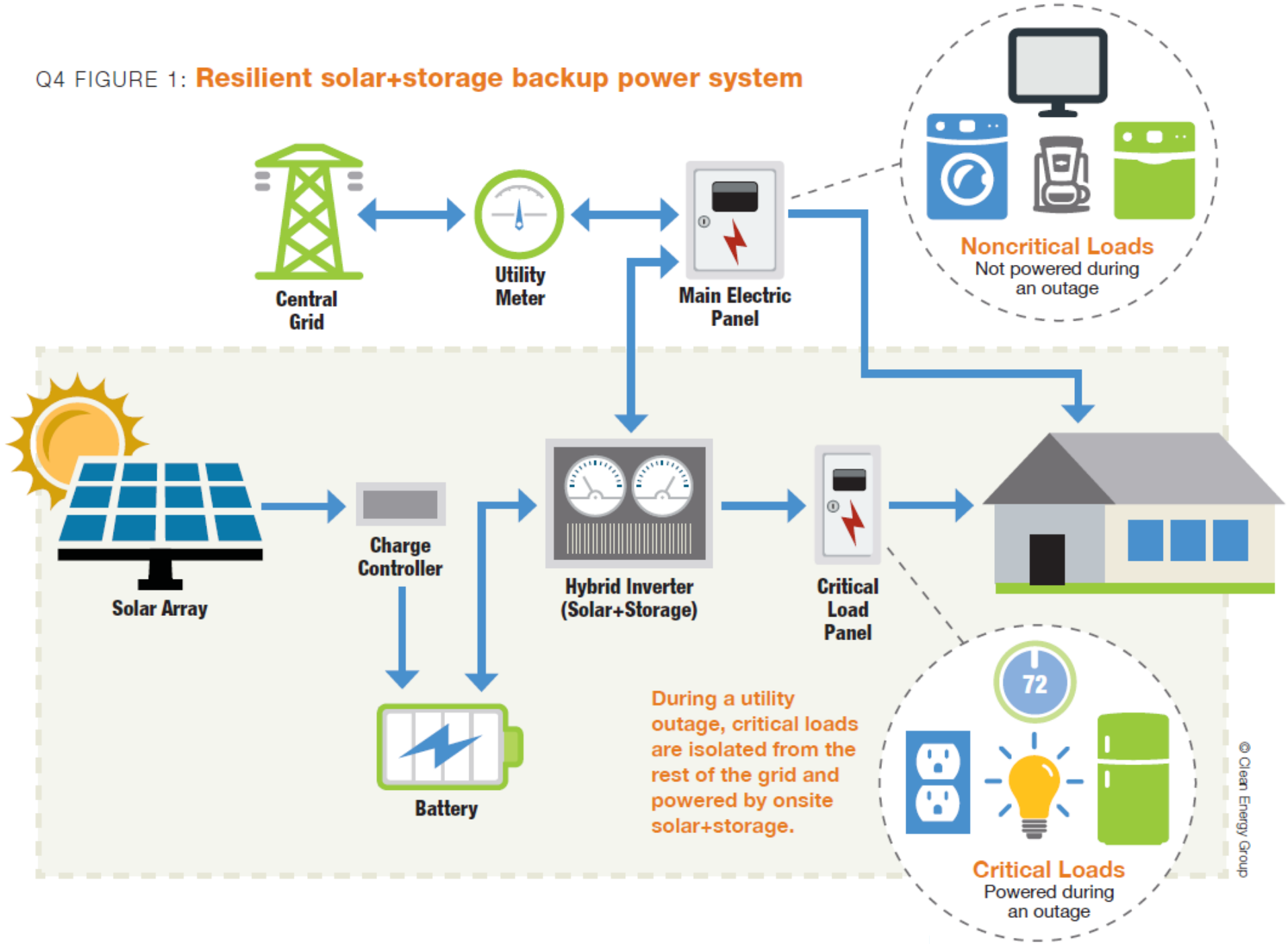



energysage NABCEP Solar Installer Survey

# Estación de Bomberos Juan Muñiz Saldivia

## Rincon, Puerto Rico

Q4 FIGURE 1: **Resilient solar+storage backup power system**



# MCKNIGHT LANE


SOLAR: 6 kW
STORAGE: 6 kWh
RESILIENCE: Lighting, heating and cooling, ventilation, refrigeration

# MAYCROFT APARTMENTS

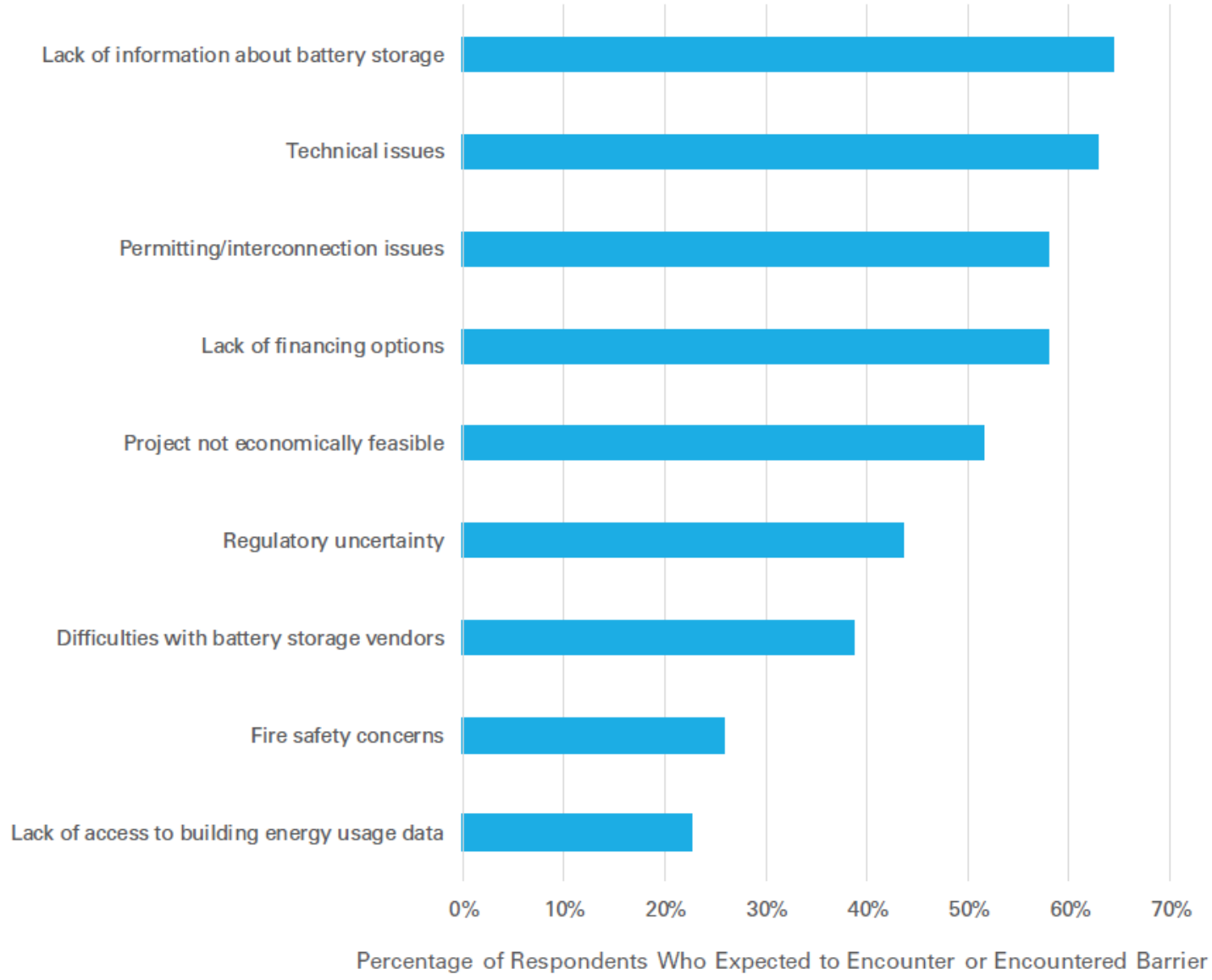
SOLAR: 64.2 kW
STORAGE: 56 kWh
RESILIENCE: Refrigeration, fans, microwave, lighting, TV, outlets

# STAFFORD HILL SOLAR FARM

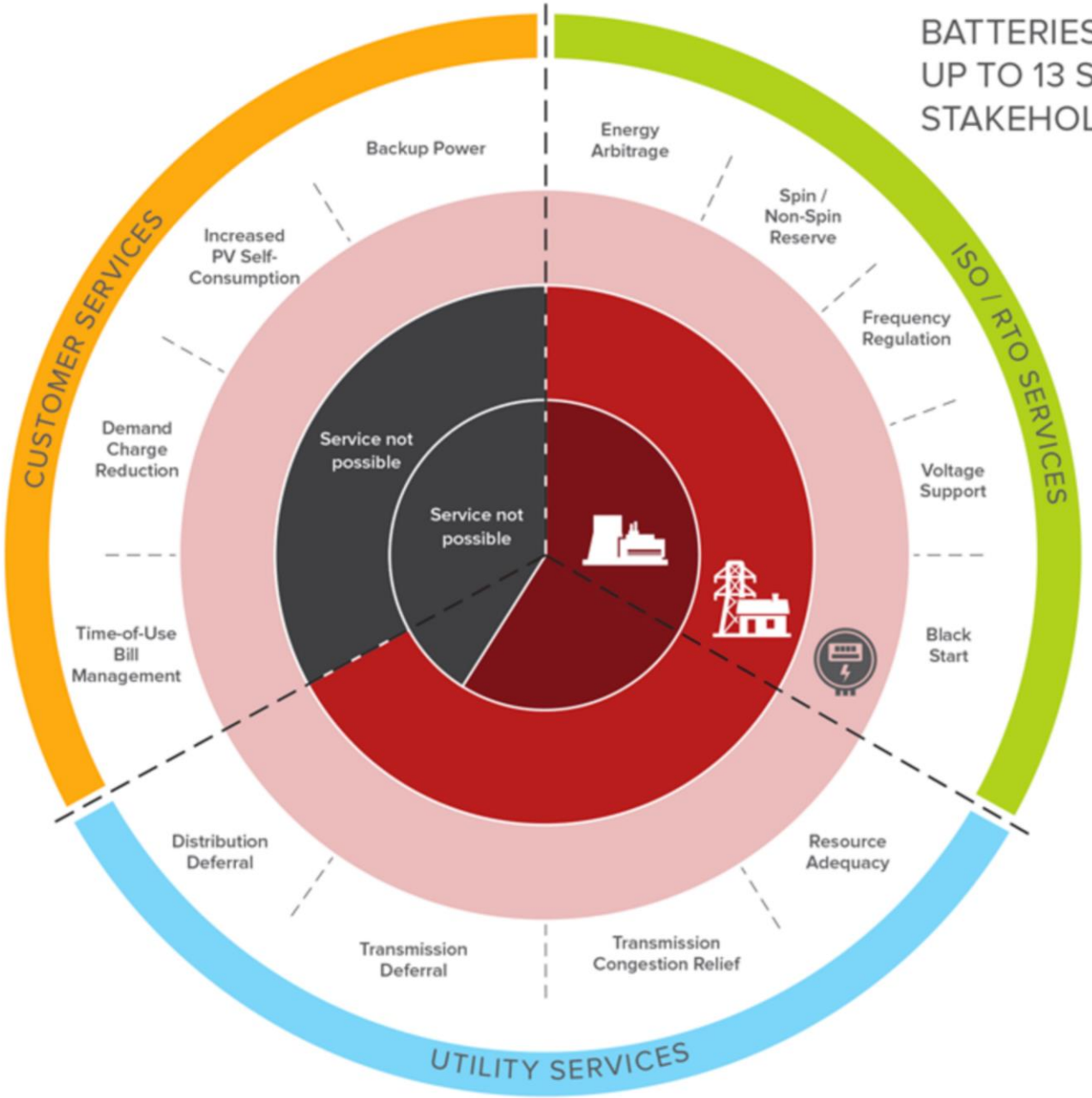

SOLAR: 2.5 MW
STORAGE: 3.4 MWh
RESILIENCE: Rutland City High School

# Barriers

65% respondents either expected to encounter or had encountered a lack of information about battery storage, the highest percentage of all barriers. Technical issues ranked as a close second.



# BATTERIES CAN PROVIDE UP TO 13 SERVICES TO THREE STAKEHOLDER GROUPS




CENTRALIZED

TRANSMISSION

DISTRIBUTION

BEHIND THE METER

DISTRIBUTED

RMI

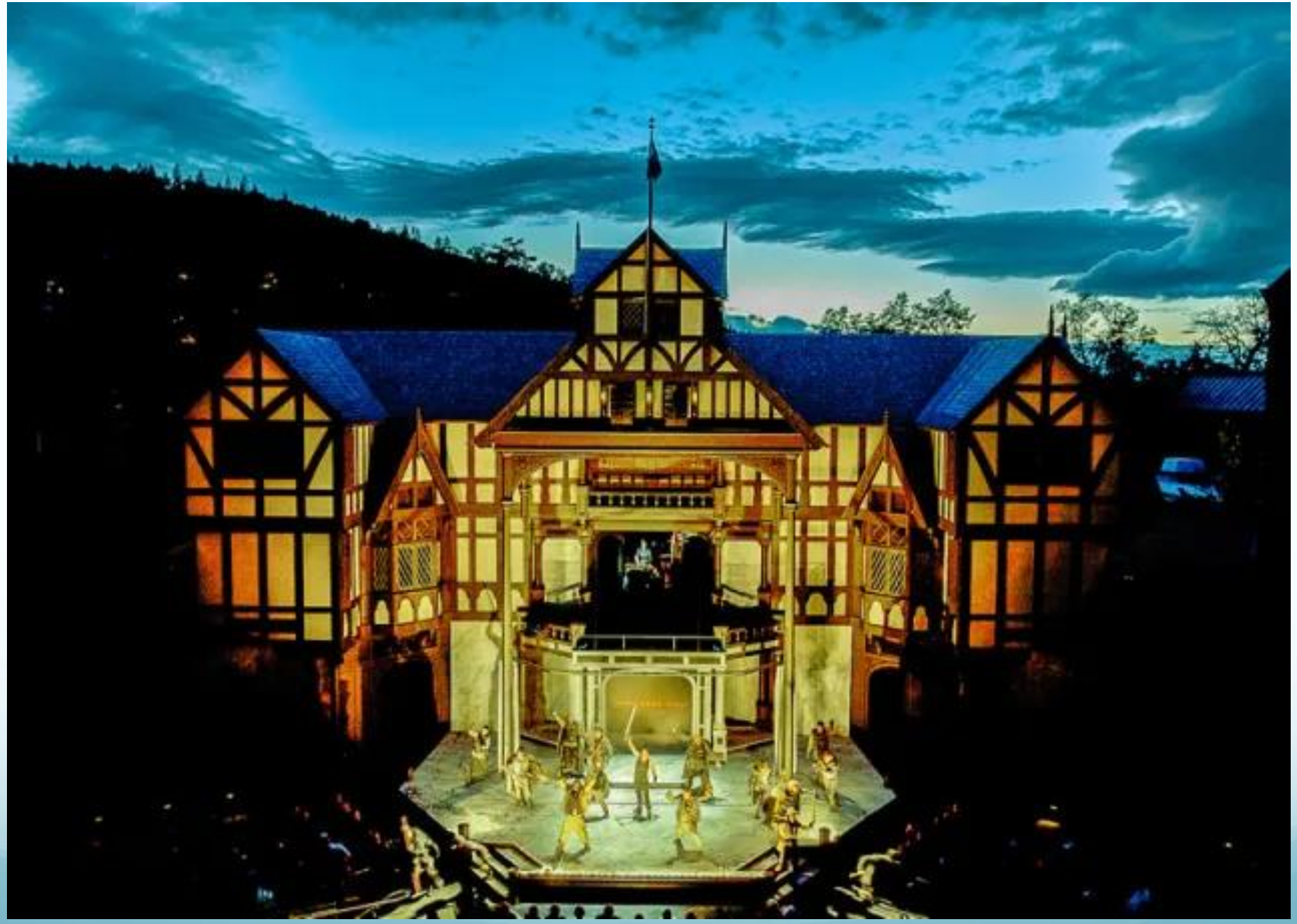
# Oregon Clean Power Cooperative

Dan Orzech

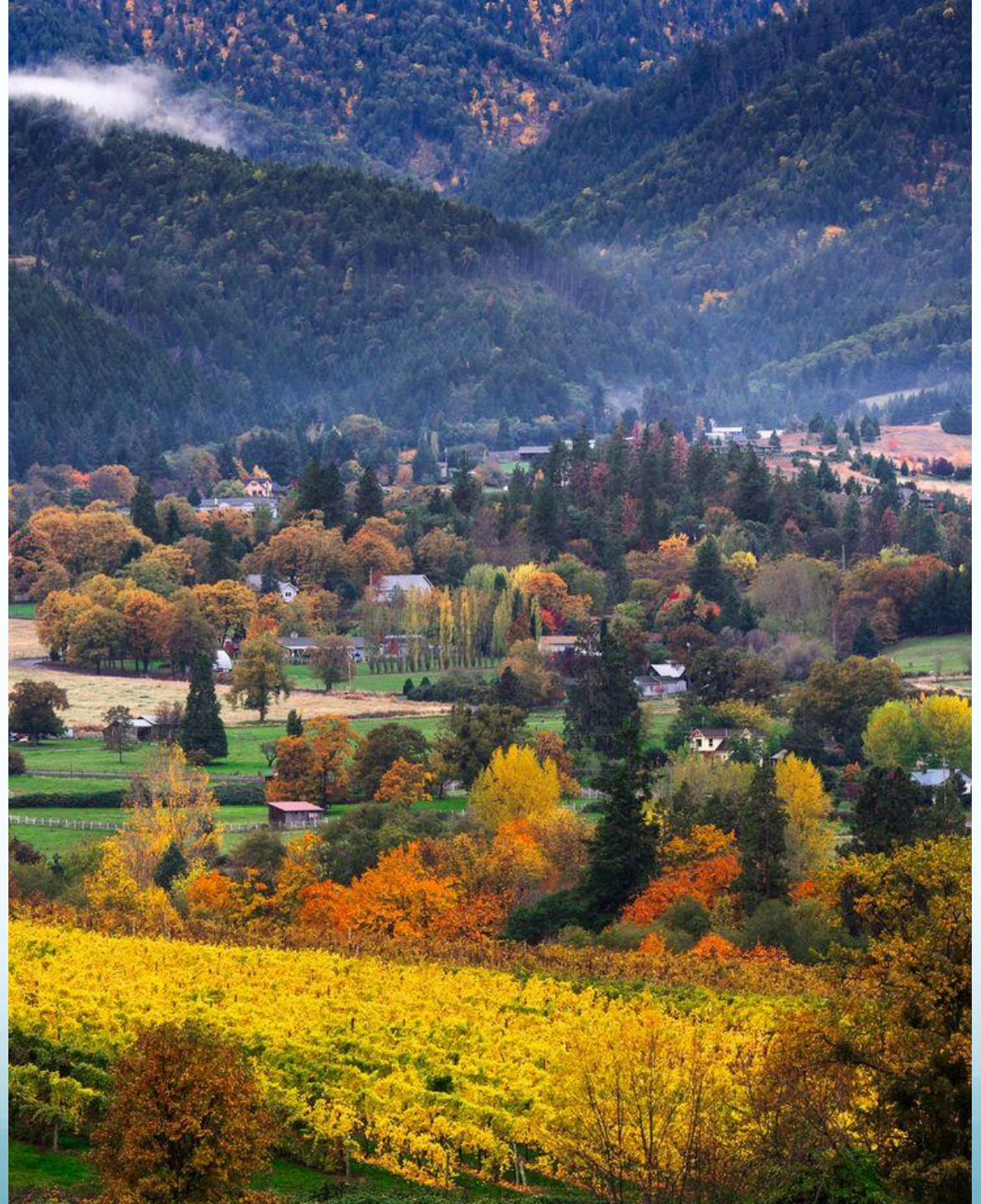
*General Manager*


OREGON
CLEAN POWER
COOPERATIVE
COMMUNITY-OWNED RENEWABLE ENERGY

2023




TESLA
TESLA



# January 26, 1700

**“…everything west of Interstate 5 will be toast.”**

Ken Murphy
FEMA Regional Administrator

“...FEMA projects that nearly thirteen thousand people will die in the Cascadia earthquake and tsunami. Another twenty-seven thousand will be injured, and the agency expects that it will need to provide shelter for a million displaced people, and food and water for another two and a half million.”

# After Sandy, gas lines stretch for miles

by Aaron Smith and Tony Maglio @CNNMoney
November 1, 2012: 1:09 PM ET


New Jersey residents waited in line at a Getty gas station in Sayreville on Oct. 31 to try and keep their generators running - their only source of power in the wake of Superstorm Sandy.

# Quake Could Threaten 90 Percent Of Oregon Fuel Supply

by Tony Schick OPB/EarthFix Sept. 27, 2015


Service Wire Co.


OREGON
CLEAN POWER
COOPERATIVE
COMMUNITY-OWNED RENEWABLE ENERGY

2023

# Northwest Arctic Borough

**Ingemar Mathiasson**

*NAB Energy Manager*

# Building with Benefits: Meaningful Benefits as a Foundation for Equitable Community Solar

## NCSP webinar

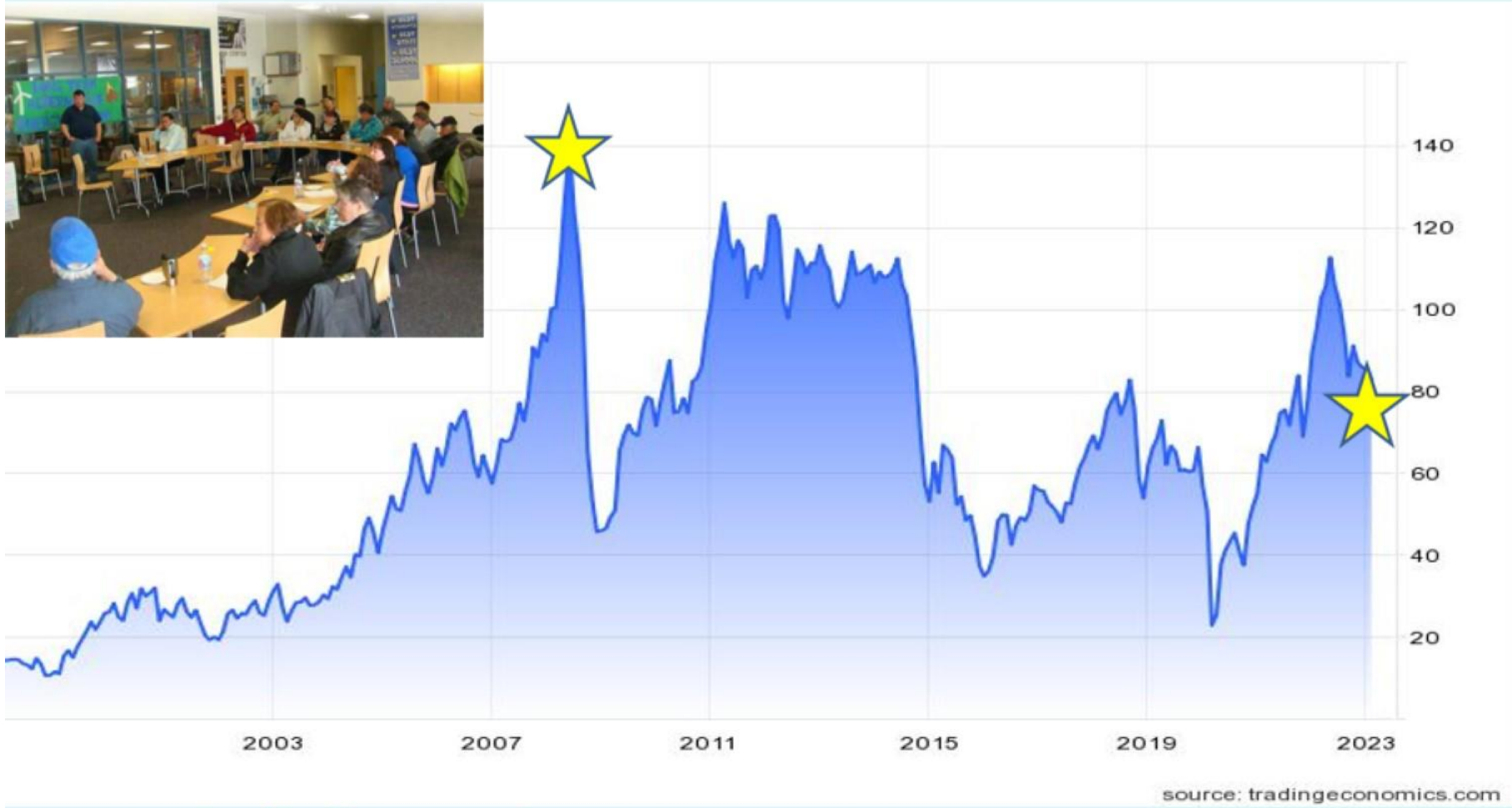

## Public Private Partnerships & The case for Community – IPP's

# Why are we here ?

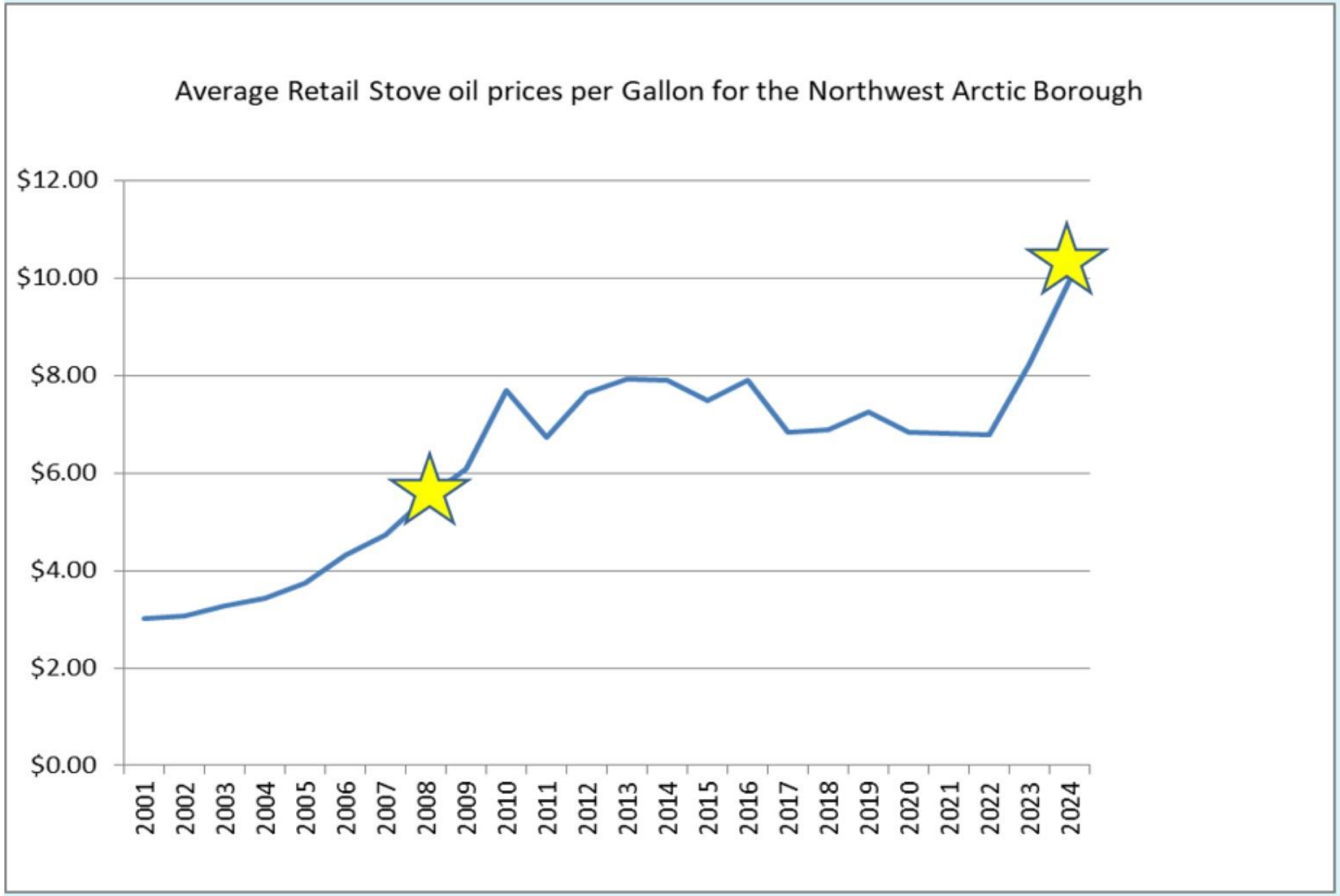
# Some background

## 2008 Energy Summit






Brent Crude oil prices over time


Average Retail Stove oil prices per Gallon for the Northwest Arctic Borough
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$0.00
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

# Fuel prices (tax included on retail) April. 2023 & FY24

| Community | Gasoline $/G Retail | Stove oil $/G Retail | Sales Tax included | Util. & AVEC Cost $ Barge/Air FY2022- FY2023 | NWABS Cost $ FY2023- FY2024 |
|---|---|---|---|---|---|
| Kotzebue KIC and KEA | 8.99 | 9.12 | 6% | 3.71 KEA/ 3.20 | 4.54/4.7605 |
| Kotzebue Vitus | 7.99 | 7.57 | 6% | | |
| Kotzebue Crowley | 7.80 | 7.97 | 6% | | |
| Ambler | 14.42 | 14.42 | 3% | 4.49 /11.50 | 6.07/6.2505 |
| Kobuk | 13.91 | 15.45 | 3% | N/A | 6.07/6.2505 |
| Shungnak | 14.03 | 15.05 | 2% | 5.45 / 11.50 | 6.07/6.2505 |
| Kiana | 7.98 | 7.73 | 3% | 2.82/4.18 | 4.71/5.0005 |
| Noorvik | 7.21 | 6.18 | 4% | 2.96/4.63 | 4.71/5.0005 |
| Selawik | 5.68 | 6.58 | 6.5% | 2.854.52 | 4.71/5.0005 |
| Buckland | 7.65 | 7.66 | 6% | 2.13-3.547 | 5.25/5.0005 |
| Deering | 5.50 | 5.20 | 3% | 2.13-4.057 | 4.71/5.0005 |
| Kivalina | 6.52 | 6.52 | 2% | 2.78/4.18 | 5.16/5.0005 |
| Noatak | 14.49 | 15.31 | 6% | 8.10/10.75 | 7.24/10.96 |

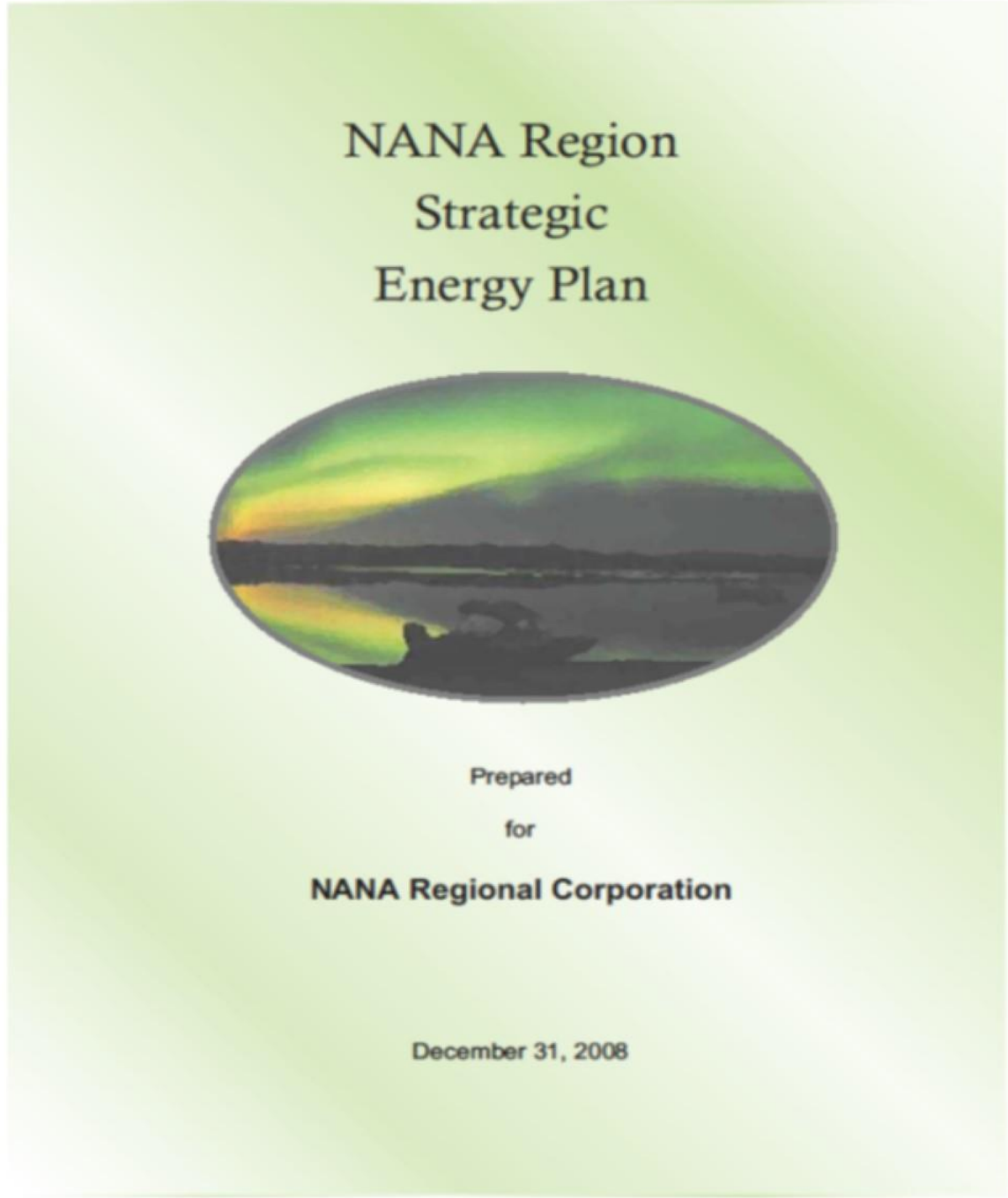
# NAB Electric rates, Apr 6 2023

| Community | 1-750Kwh $/Kwh with PCE | Tax | 1-750 Kwh Actual cost/Kwh with tax | 0-750 $/Kwh No tax | 750-up $/Kwh No tax | Utility Non firm power purchase rate $/Kwh 1/30/2023 |
|---|---|---|---|---|---|---|
| Kotzebue KEA | 0.2275 | 6% | 0.24 | 0.3949 | 0.3918 | N/A |
| Ambler AVEC | 0.2651 | 3% | 0.2731 | 0.8621 | 0.7566 | 0.3949 |
| Kobuk AVEC | 0.3348 | | 0.3348 | 1.0988 | 0.9933 | N/A |
| Shungnak AVEC | 0.3348 | 2% | 0.3414 | 1.0988 | 0.9933 | 0.6138 |
| Kiana AVEC | 0.2553 | | 0.2647 | 0.6654 | 0.5599 | 0.2733 |
| Noorvik AVEC | 0.2545 | 4% | 0.2647 | 0.6490 | 0.5435 | 0.2507 |
| Selawik AVEC | 0.2521 | 7% | 0.2697 | 0.6027 | 0.4972 | 0.2053 |
| Buckland BEC | 0.2781 | | 0.2781 | 0.4900 | 0.4900 | 0.2823 |
| Deering IEC | 0.4081 | | 0.4081 | 0.6747 | 0.6747 | 0.3575 |
| Kivalina AVEC | 0.2535 | 2% | 0.2586 | 0.6295 | 0.5240 | 0.2442 |
| Noatak AVEC | 0.3724 | 6% | 0.3947 | 1.1364 | 1.0309 | 0.6682 |

# 2008

**NANA Regional**
**11 communities**

**Kotzebue**
**Noorvik**
**Selawik**
**Kiana**
**Deering**
**Buckland**
**Noatak**
**Kivalina**
**Ambler**
**Shungnak**
**Kobuk**



# Northwest Arctic Energy Steering Committee

**Co-Hosted & Sponsored by:**

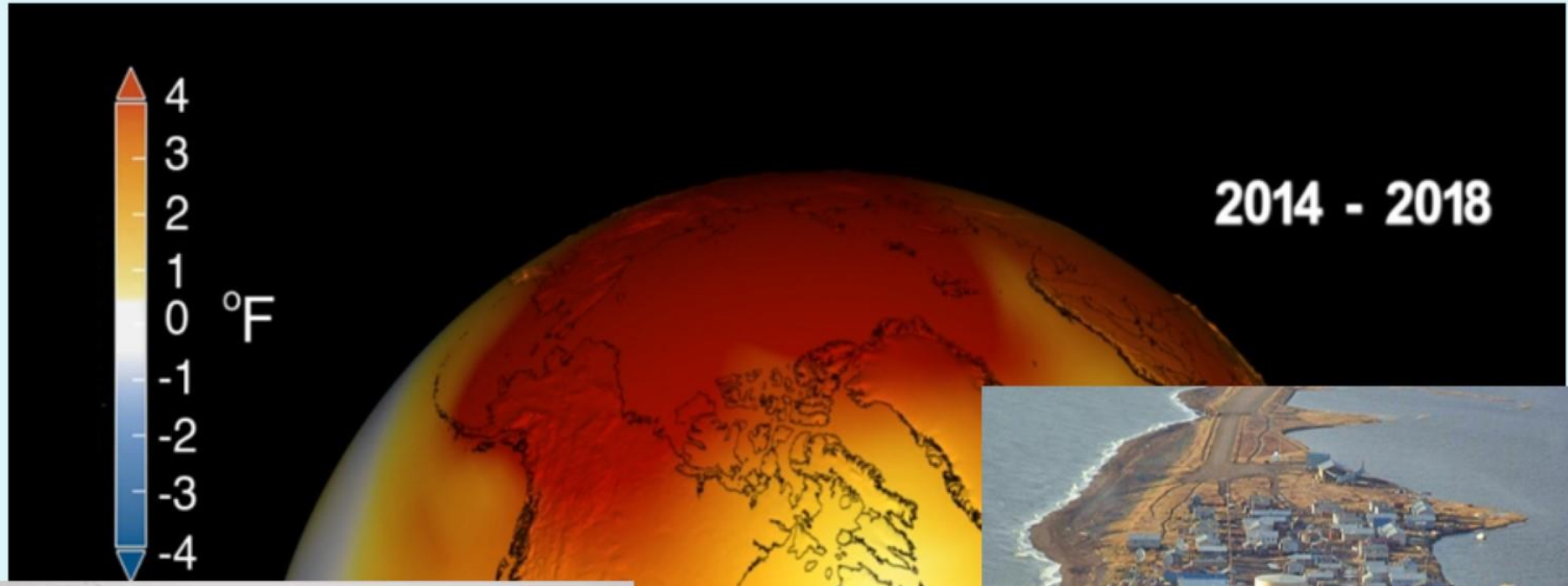
***Northwest Arctic Borough – Energy Program***

***NANA Regional Corporation – Alternative & Village Energy Program***

2009-2023

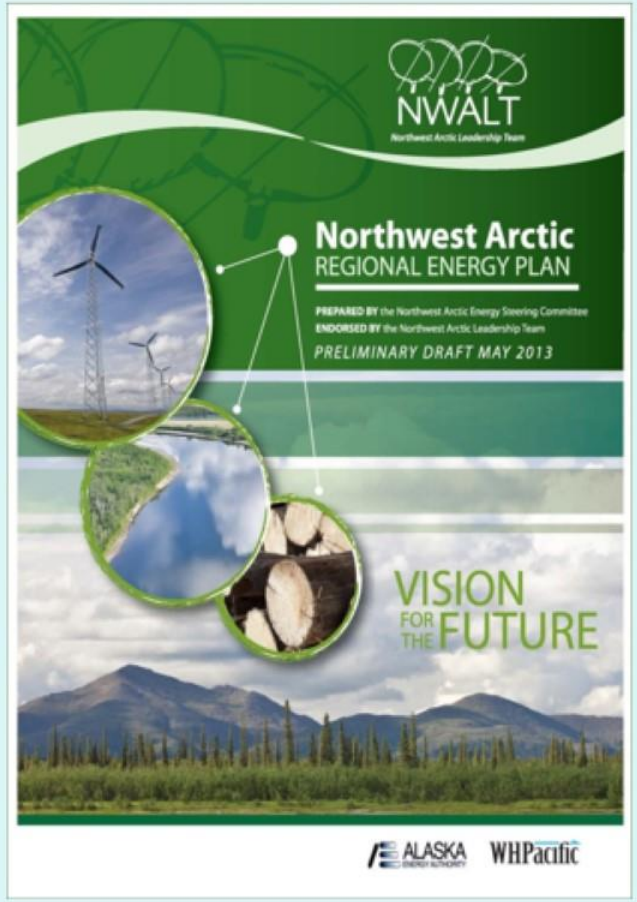
# The Artic Warming up faster than the rest of the world

## Climate Change Mitigation Plans was needed



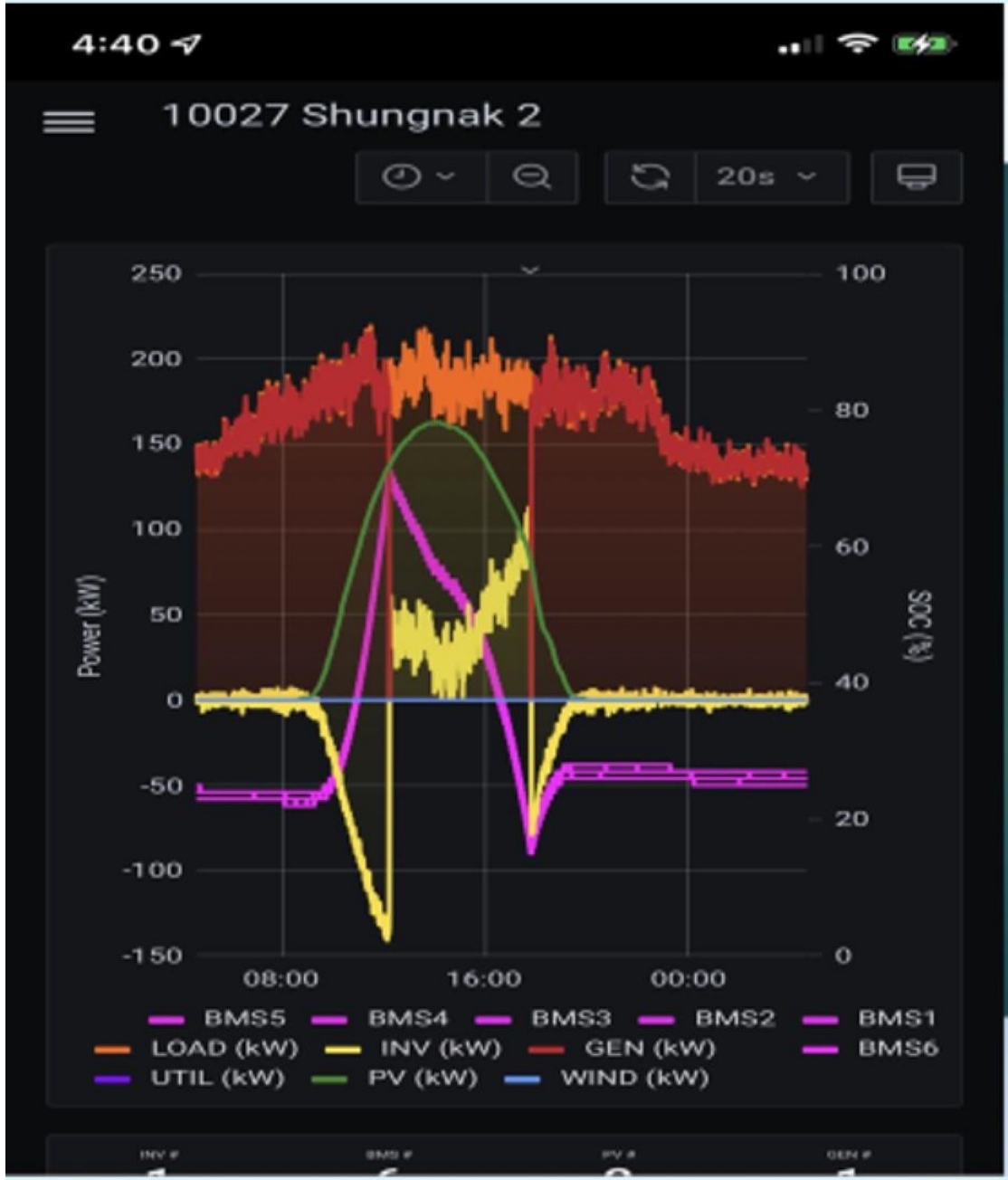

**NANA-NAB Energy planning**
Started in 2008-2009
Current version 2020
Available @Nwabor.org

**The vision is for the Northwest Arctic region to be 50 percent reliant on regionally available energy sources, both renewable and non-renewable, for heating and generation purposes by the year 2050. And to combat rapid climate change due to greenhouse gas emissions like Co2, Methane and other harmful effects of fossil fuel usage.**




**<u>The progression is planned as follows:</u>**

**10 percent decrease of imported diesel fuels by 2025**
**On track**
**25 percent decrease of imported diesel fuels by 2030**
**50 percent decrease of imported diesel fuels by 2050**




## To get there, we need to go;

Diesels Off

# Our Single Focus in 2008-2012

- To try to stabilize the cost of electricity by developing local energy resources as much as possible ( Wind-Hydro ) and possibly bring down cost/Kwh

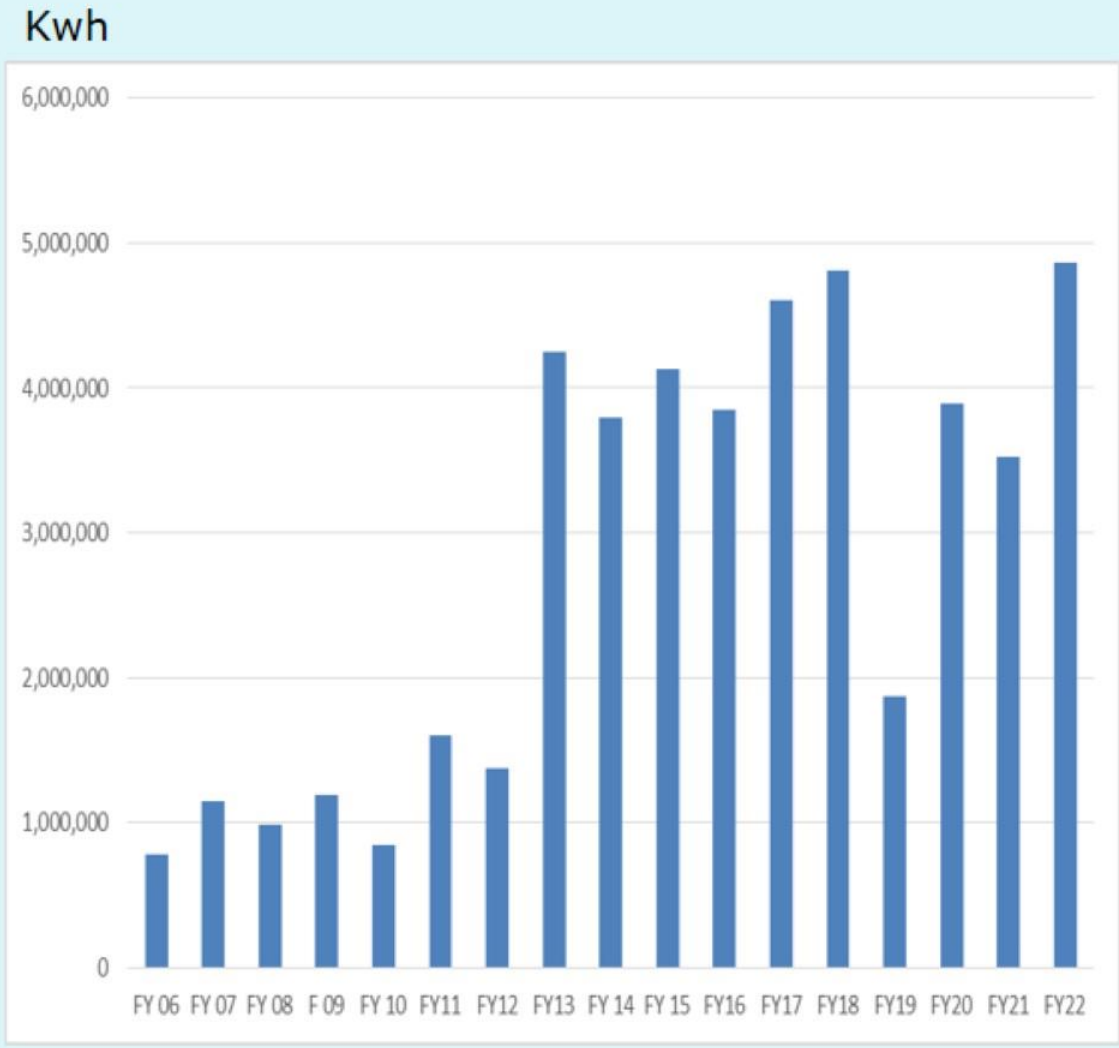
- Projects were funded and then implemented by Electric Utilities to offset the use of Diesel fuel.

- The cost to the Households/Kwh did not change in communities that receives PCE funding,
- Instead, as more Alternate Energy project was built by grants, the allocation of PCE decreased to the communities.

# Buckland & Deering Wind Diesel Project 2008-2012

As a condition of the grant, Independent Power Producers will agree to sell energy resources for electricity and heat at a cost-based rate for the economic life of the project.

# Wind projects and data




| | Total | Diesel | Value |
|---|---|---|---|
| | Kwh | Gallon | $ 3.75/Gallon |
| | | saved | |
| Selawik | 1,158,985 | 82,785 | $310,442.41 |
| Buckland | 1,105,121 | 78,937 | $296,014.55 |
| Deering | 559,725 | 39,980 | $149,926.34 |
| Kotzebue | 44,662,843 | 3,190,203 | $11,963,261.52 |
| Total | 47,486,674 | 3,391,905 | $12,719,644.82 |

**3.4 Mil Gallons of Diesel not needed**

# Independent Power producers shows up in Alaska
# Fire Island

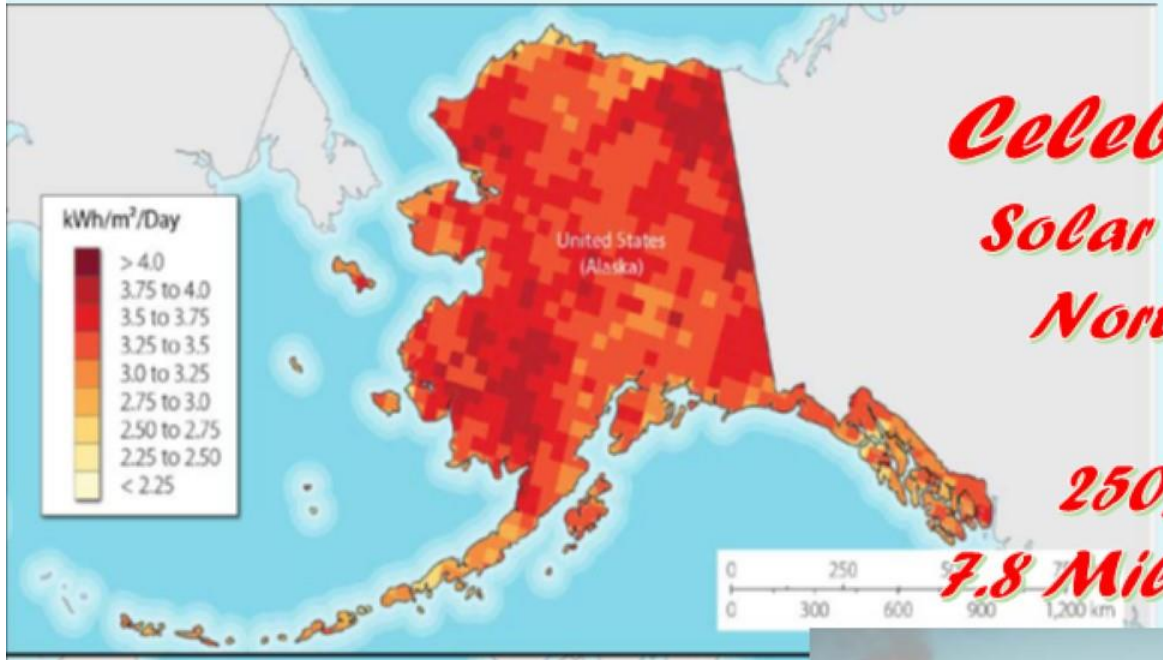
- September **2012**
- The project started production in September 2012 and supplies approximately 2% of Chugach's retail load under a 25-year power purchase agreement with Cook Inlet Region Incorporated and its subsidiary Fire Island Wind LLC, who owns and operates the facility.

# 2012 NAB Synergy project over 10 Years has saved 50,000 Gallons


- Borough population: 7,810
- Electricity for village water / sewer plants
- Launched in Ambler, replicating across borough
- 10,000 kWh/year from 10 kW array
- Peak production April-July
- Long sunlight hours in summer + 30% reflection from snow-covered ground in spring


Photos: Northwest Arctic Borough

Powering water treatment facilities with renewable energy




# Celebrating 10 Years of Solar PV development in the Northwest Arctic Borough 2013-2023

## 250,000 Gallons saved

## 7.8 Mil lb of CO2 not released


# Transition to Village Independent Power Producers IPP's, 2020


## So why develop Independent power producers

- The Communities taking control of their Energy future, developing their local resources. This creates buy in and good relationships with the utility.

- Being able to sustain PCE support to the communities and stabilize energy cost.
- Better economics, Circular economy
- Funding collected pays for further development and local workforce expertise. The money stays in the community instead of sending the money to far off countries.

# Reasons for Regional approach to Alternate Energy Development

- *Regional* support to apply for and manage Energy grants, including access to Dept. of Energy and other funding.

- Economy of Scale and Increasing Efficiency
- (Small, single projects are too expensive).

- Develop Regional Energy infrastructure:
- Wind, Solar, Hydro, Interties, bulk fuel storage & direct Household involvement.

- Admin help for Independent power producers (IPP's) for PCE calculations, utility rates & billing.
- Job Creation - Workforce Development and Training/Capacity building.
- The Region speaking with one voice. Can advocate on behalf of PCE and State wide Energy Policy.
- This creates Energy Security and is needed to stop the increasing cost of Energy and hedge against fuel increases and supply disruptions.

# The Shungnak Solar IPP Project

**Shungnak-Kobuk 223.5 DC/200 AC Kw Solar/battery PV array.**
**Using 550pc Bifacial 405W panels**

**Blue Planet environmentally friendly LFP Battery.**
**Capable of holding the two communities for 2 Hours without Generators or Solar power.**
**Capacity 250Kw/352Kwh**

**Start of construction April 2021 completed Sep 2021.**

**Total project cost $ 2,363,215.11**

**Funded by USDA HECG @ $ 1,291,675.00**
**In-kind VIF and NAB funds $ 1,071,540.11**

# Shungnak-Kobuk Solar example

- A Grant opportunity from USDA HECG was secured by the 2 Tribes by allowing NAB to apply on behalf of the Communities.
- The communities are interconnected with a power line so the proposed Solar project benefits both.
- Through an MOA a working agreement is executed between the 2 tribes to become an IPP (independent power producer)
- A power purchase agreement is executed with the utility AVEC.
- AVEC pays for the Solar power and recover the cost partly from the PCE fund.
- Another MOA is executed with NAB for help with admin and investment of funds.
- An Energy fund is established for the communities.
- Funds dispersed for insurance and maintenance and eventual further build-out of the Solar array.

## Alaska Tribes Recognized with Sunny Award for Equitable Community Solar



**Congratulations!** The DOE Solar Energy Technologies Office awarded a Sunny Awards Grand Prize to the Shungnak-Kobuk Community Solar Battery Independent Power Producer project, in Shungnak, Alaska.

**This solar and battery project** led by the Shungnak and Kobuk tribes in the Northwest Arctic Borough region aims to stabilize the cost of electricity and allow the communities to take charge of their energy future. The Shungnak project also received the 2022 Microgrid Project of the Year from *Solar Builder* magazine.

**Following suit** Among current Office of Indian Energy projects, the Northwest Arctic Burrough 2021 Project with the Native Village of Noatak is emulating the Shungnak project and is making progress on a high-penetration distributed solar-battery hybrid system.


A Loud Shout-out to all Partners; USDA, Shungnak IRA, Kobuk IRA, NAB, NANA, AVEC, TECK, ANRI, AGETO, Blue Planet, Deerstone, Daylight services, Launch Alaska & others that contributed to the success of the project

# Shungnak-Kobuk IPP Yearly financials FY22

| | |
|---|---|
| Estimated Gross Annual Revenue | $120,000.00 |
| Insurance | $3,771.32 |
| Electric | $1,958.05 |
| Ageto service fee | $3,242.28 |
| Tribe Employee | $8,683.44 |
| Fuel | $3,150.00 |
| Total Estimated Expenses | $20,805.09 |
| Estimated Net Income | $99,194.91 |
| Estimated Administrative Fee (10% Annual Net) | $9,919.49 |
| Annual Income Less Admin Fee | $89,275.51 |

# The Noatak Solar IPP Project 2023

Noatak 280.6 DC/250Kw AC Kw Solar/battery PV array phase 1.
Using 432 pc Canadian solar Bifacial 650 W panels
Expansion to 380.6 Kw available for phase 2.

Kronus/Pylontech LFP Battery 438.5 Kwh
Capable of holding the to communities for 2 Hours without Generators or Solar power.

Construction Sep 2022 to July 2023.

Total project cost $ 2,946,886.00
Funded by DOE Tribal grant @ $ 2,008,765.00
Denali Commission $ 134,079.00
Teck (Red Dog) $ 100,000.00
NANA VEI and inkind $ 309,998.00
In-kind VIF and NAB funds $ 394,123.00

# The Selawik Solar IPP and REPOP

Selawik 130kw DC/100Kw AC Kw Solar/battery PV array phase 1.
Using 200 pc Canadian solar Bifacial 650 W panels
Expansion to 500 Kw available for phase 2.

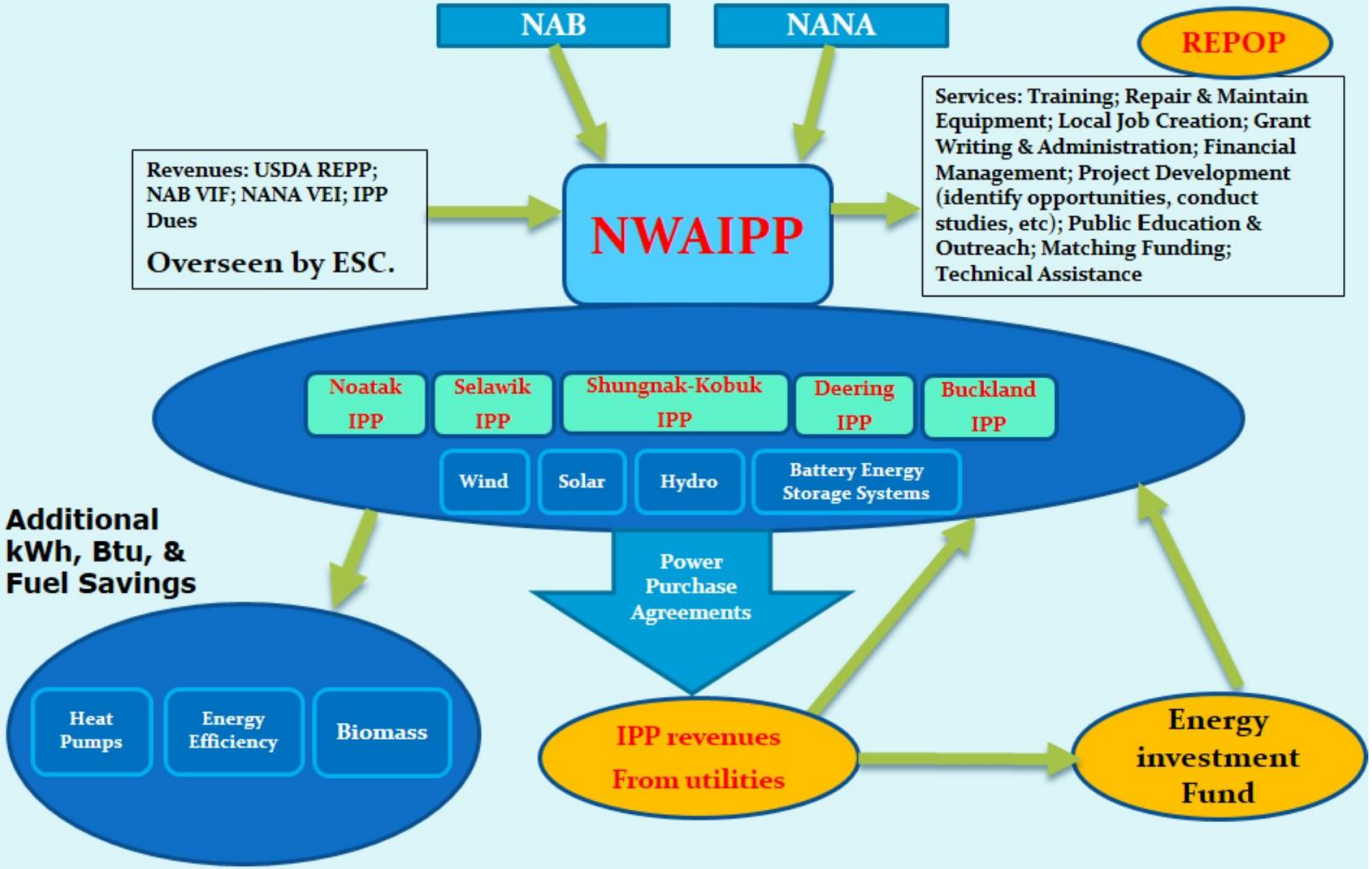
Blue Planet LFP Battery, 1 Mw
Capable of holding the to community for 4 Hours
without Generators or Solar power.

Start of construction Sep 2023 completion by July 2024.
Total project cost $3,611,190.00
Funded by USDA REPP @ $1,998,820.00
AEA REF 14 $ 250,000.00
AVEC $ 100,000.00
Teck (Red Dog) $ 100,000.00
NANA VEI and inkind $ 130,000.00
In-kind VIF and other NAB funds $ 1,032,370

# 5 Year plan
# Solar IPP's full build out

| Community | Total | | | Total |
|---|---|---|---|---|
| | Solar PV | BESS | Combined | Diesel offset |
| | kW | MW | MWh/year | Gallons/year |
| Ambler | 400 | 1 | 360 | 25,714 |
| Buckland | 450 | 1 | 405 | 28,929 |
| Deering | 250 | 0.5 | 225 | 16,071 |
| Kiana | 400 | 1 | 360 | 25,714 |
| Kivalina | 450 | 1 | 405 | 28,929 |
| Noatak | 550 | 1 | 495 | 35,357 |
| Noorvik | 550 | 1 | 495 | 35,357 |
| Selawik | 500 | 1 | 450 | 32,143 |
| Shungnak-Kobuk | 500 | 1 | 450 | 32,143 |
| TOTALS | 4,050 | 8.5 | 3,645 | 260,357 |

# Regional IPP Organizational Structure




# The Energy Steering Committee
# 15 Years and Going 2009-2023

## Goals and lessons learned

- Make a sustained effort, realize that changes comes slowly with understanding of new ways and operation.

- Continue to work with the Regional Energy Plan
- It is the "Vision" for the future, from the people for the people.

- Make sure the document gets updated periodically as it is a "Dynamic" living document and needs to be able to "Adapt" to changes when new thinking and resources comes along.
- Hopefully it will never be completed.

## Energy Policy

- Do we develop Energy resources for short time profits ?

- Or do we develop Energy resources that can sustain the Region for the foreseeable future and create a cleaner environment for our Children ?

# Energy and Persistence Conquer all things

Benjamin Franklin

Questions ?
IMathiasson@nwabor.org
Tel. 907-445-5034

Energy Efficient Coordination

2003 4 11

# Lawrence Berkeley National Lab

Ben Paulos

# Resilient Solar for Critical Facilities

- EBCE serves Oakland, Fremont, Stockton, etc.
- Critical facilities: fire, police, shelters, health, communications, etc.
- EBCE surveyed sites, did pre-engineering, and made a standard PPA = more bidders, lower cost
- For cities: no upfront costs, no new procurement or maintenance expertise required, and energy bill certainty -- with reliable backup power during grid outages thrown in for free.


EAST BAY COMMUNITY ENERGY

# Scalable

- Phase 1:  solar and storage on 30 city-owned critical facilities in four cities.  3.1 MW of solar and 6.2 MWh of battery storage
- Phase 2: 50-100 microgrids in Oakland, Emeryville, Livermore, and Pleasanton
- Applied for $30 million grant from the DOE Grid Resilience and Innovation Partnerships (GRIP) program
- ebce.org/resilient-facilities

EAST BAY COMMUNITY ENERGY


Discussion + Q&A

# Building with Benefits Webinar Series

GREATER HOUSEHOLD SAVINGS: Monday, May 22nd 2:00 – 3:15 p.m. (ET) — SLIDES & RECORDING

LMI HOUSEHOLD ACCESS: Wednesday, May 31st 2:00 – 3:15 p.m. (ET) — SLIDES & RECORDING

RESILIENCE AND GRID BENEFITS: Wednesday, June 7th 2:00 – 3:15 p.m. (ET) — SLIDES & RECORDING

COMMUNITY OWNERSHIP: *NEW DATE* Tuesday, July 25th 2:00 – 3:15 p.m. (ET) — REGISTER

WORKFORCE DEVELOPMENT AND ENTREPRENEURSHIP: Wednesday, July 5th 2:00 – 3:15 p.m. (ET) — REGISTER

COMMUNITY ENGAGEMENT & INNOVATION: Wednesday, July 12th 2:00 – 3:15 p.m. (ET) — REGISTER

# 2023 Sunny Awards for Equitable Community Solar

- NCSP launched the **2023 Sunny Awards** on April 20, 2023 to recognize community solar programs and projects that include meaningful benefits

- Up to five $10,000 Grand Prize Winners and up to 30 additional $2,500 Sunny Finalize Awards and up to 15 $5,000 Meaningful Benefits/Engagement Awards


**Apply by July 14, 5pm ET!**

**Applicants can receive recognition for programs that include:**
LMI access, household savings, resilience and grid benefits, community ownership, workforce development, equitable community engagement, and innovation

# Looking Forward

Apply for the 2023 Sunny Awards for Equitable Community Solar

Register for 'Building with Benefits' Webinar Series

Join the Community Power Accelerator


**Register to Join NCSP:**
https://ncsp.solarinyourcommunity.org/registrations/groups/39758

# Resources + Follow Up

DOE Resources Shared:

- NCSP Building with Benefits webinar series: https://www.energy.gov/communitysolar/building-benefits-meaningful-benefits-foundation-equitable-community-solar-webinar
- NCSP Community Power Accelerator: https://www.energy.gov/communitysolar/community-power-acceleratortm
- NCSP Sunny Awards: https://www.energy.gov/communitysolar/sunny-awards-equitable-community-solar